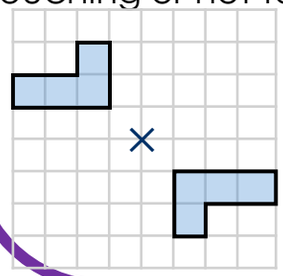
Year 9 Maths: Topics 9, 10 & 11
Rotation and translation, Enlargements and similarity & Loci

Week 1

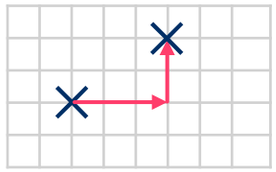
This topic looks at rotation and translation. We will start by recapping line **symmetry** and moving on to rotational symmetry. **Rotational symmetry** is when you turn a shape and it still looks the same. You could turn it clockwise (to the right) or anticlockwise (to the left). How many times it looks the same in a full turn is know as the order of rotation.
We will then look at rotating a shape on a grid about a point. This point can be touching or not touching the shape.



We can also say how many degrees it has been rotated by
90° is a quarter turn
180° is a half turn

Week 2

This week we will look at translating a shape. In maths **translate** means to move. When translating the shape will not change direction but will move sideways, vertically or a combination of both. The path the shape will take is given by a vector. A **vector** is one number on top of another number inside brackets. The top number tells you the sideways movement and the bottom number tells you the vertical movement.



This point has been translated by the vector $\binom{3}{2}$

Negative numbers in a vector mean and to the left and down.

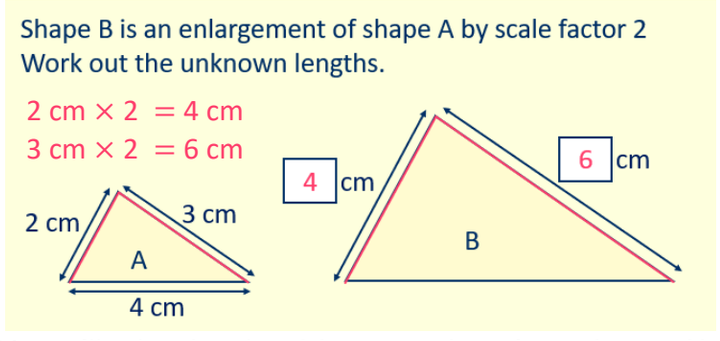
Week 3

Our next topic is Enlargements and Similarity. In maths **enlargement** is when something gets bigger or smaller. How much bigger or smaller it gets is called the **scale factor**. An integer scale factor makes a shape bigger whereas a fraction scale factor makes a shape smaller.
We will practice enlarging shapes by scale factors and also from points on a grid.

The point is called the centre of enlargement.
Here the shape has been enlarged by a scale factor of 2 and 4.

Week 4

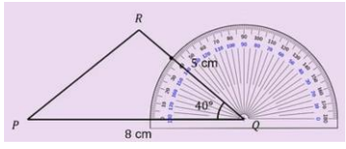
This week we will look at **similar shapes**. Shapes are described as similar if one is an enlargement of the other.
If shapes are similar it means we can use the scale factor to find missing lengths on the shapes.



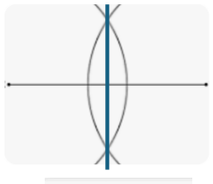
We will also look at how enlarging doesn't affect the angles in the shape. They stay the same.

Week 5

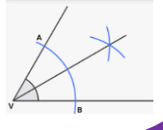
The next topic is about constructing diagrams accurately. We will use mathematical equipment to do this such as a pair of compasses and a protractor.



We can draw accurate shapes by using a protractor to make sure the angles are the correct size and a ruler to make the sides the correct length.
We will also look at drawing **perpendicular lines**.
Perpendicular lines are lines that meet or cross at 90°.



An **angle bisector** is a line that cuts an angle in half exactly.



Key Vocabulary

Symmetry: When an object is balanced or the same either side of the line.
Rotate: To turn a shape.
Clockwise: Turn to the right.
Anti clockwise: Turn to the left.
Translate: To move a shape on a grid.
Vector: Describes the movement.
Enlargement: When something gets bigger or smaller.
Scale Factor: It tells you how much bigger or smaller it gets.
Similar Shape: When one is an enlargement of the other.
Perpendicular lines: Lines at 90° to each other

Year 9 Maths: Topics 6, 7 & 8
Graphs, Equations & Conjectures

Week 1

Questions	Answers
What is symmetry?	When an object is balanced or the same either side of the line.
What does Rotate mean?	To turn.
What direction do you turn to go clockwise?	To the right.
What is order of rotation?	How many times the shape looks the same whist being rotated a full turn.
How many degrees are in a quarter turn?	90°

Week 2

Questions	Answers
What does translate mean in maths?	To move an object.
What is a vector?	The path that an object will take when it moves.
What does the top number of a vector tell you?	The horizontal movement.
What does the bottom number of a vector tell you?	The vertical movement.
What do negative numbers mean in a vector?	It moved to the left or down.

Week 3

Questions	Answers
What is enlargement?	An object that gets larger or smaller.
What is scale factor?	It tells you how much bigger or smaller the object is.
What does a fraction scale factor mean?	That the object got smaller.
What is the centre of enlargement?	The point from which the enlargement happens.
What does a scale factor of 2 mean?	It is twice as big.

Week 4

Questions	Answers
What is a similar shape?	Two shapes where one is an enlargement of the other.
What can you use to find missing lengths in similar shapes?	The scale factor.
What happens to the angles in the enlarged shapes?	They stay the same.
Give real life examples of enlargements.	Toy cars and dolls. Resizing photos. Maps

Week 5

Questions	Answers
What piece of equipment do we use to measure angles?	A protractor.
In maths was does construct mean?	To draw accurately.
What are perpendicular lines?	Lines that meet or cross at 90°.
What is an angle bisector?	A line that cuts an angle in half exactly.

Key Vocabulary

Symmetry: When an object is balanced or the same either side of the line.
Rotate: To turn a shape.
Clockwise: Turn to the right.
Anti clockwise: Turn to the left.
Translate: To move a shape on a grid.
Vector: Describes the movement.
Enlargement: When something gets bigger or smaller.
Scale Factor: It tells you how much bigger or smaller it gets.
Similar Shape: When one is an enlargement of the other.
Perpendicular lines: Lines at 90° to each other.